



# Weill Cornell Graduate School of Medical Sciences

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## **Clinical Epidemiology and Health Services Research Courses**

### **Summer Intensive Courses**

#### **Behavioral Science and Health Education Theory**

The objective of this course is to provide an overview of theories of behavioral and social science and their roles in health services research and clinical research. The course also covers the development and evaluation of theory-based health education approaches used in medicine. As a final project, students develop a behavioral health interventions drawing on models taught in didactic sessions in order to address key patient problems. By the end of the course, students are able to identify behavioral theories most applicable to addressing a given question.

#### **Communicating Research Results**

The objective of this course is to teach techniques for oral and written dissemination of data. Topics include abstract writing, graphic presentation of data, use of slides and overheads, oral presentation skills, and manuscript preparation and submission. At the end of the course, students are able to organize the results and to write an abstract, prepare a poster, and an oral presentation.

#### **Decision Analysis**

The objective of this course is to teach the basics of probabilistic thinking and the concept of heuristics. Students learn the five-step process, specifically, the structuring of the problem, the application of probabilities, the application of values, the calculation of expected utilities, and the sensitivity analysis. By the end of the class, students are able to ask and answer questions using decision analytic models.

#### **Foundations of Health Services Research**

This course introduces students to critical issues in health care organization, financing and policy, which constitute the core of health services research topics including access and equity issues, costs of care, health care markets, health care quality and medical outcomes, health insurance and managed care effects on patient and physician behavior, and the evaluation of health care technologies and innovations. Models for understanding institutional behavior, as well as behavior within organizations are reviewed. By the end of the course, students are able to use the concepts to develop approaches to solving health care problems.

#### **Fundamentals of Clinical Epidemiology and Research Methodology**

The objective of this course is to teach basic architecture of clinical and health services research with an emphasis on three critical components: the population, interventions, and outcomes. Students also learn about different study designs, specific challenges in both observational and interventional studies, and methods of addressing potential biases. Basic principles of measurement for categorical and continuous data, including the sources of variance for such data are emphasized. Students learn how to evaluate validity and

reliability of data and critical appraisal of the published literature to illustrate threats to validity. By the end of the course, students are able to read the literature critically and develop detailed proposals for their own projects.

### **Introduction to Biostatistics**

This course provides an introduction to methods and concepts of biostatistical analysis. Topics include: statistical computing, descriptive statistics in tables and graphics, probability and distributions, sampling distributions, hypothesis testing and statistical comparison, types of error, significance and confidence levels, sample size, and nonparametric methods. By the end of the course, students have an understanding of basic statistical concepts and models.

### **Measuring Psychosocial and Clinical Constructs**

This course, which has focused primarily on depression, will be expanded to provide an overview of the methods used in measuring psychosocial and clinical variables, such as depression, stress, social support, anxiety, comorbidity, and disease severity. It will also review widely used measures of function and quality of life. Students will learn how to collect high quality data using standardized procedures. In addition, they will learn the basic rules required for creating new measures for variables that are not adequately captured with existing measures. At the conclusion of the course, students will be able to identify the most appropriate measures for their projects.

### **Practical Applications and Computer Lab**

The objective of this course is to provide an approach to computer technologies, which facilitate the design, implementation, and analysis of quantitative data. It includes methods of primary data collection, data coding and error checking, as well as an introduction to data analysis using statistical programs. Students learn to create computer-based data collection tools. The course is taught in a computer laboratory. At the end of the course, students are able to develop a primary data collection instrument, set up a database, and perform simple descriptive analysis of their data.

### **Qualitative Research Methods**

The objective of this course is to enable students to gain a basic fluency with qualitative research methods, and understand the importance of formative methods with data from key informant surveys, focus groups, or face-to-face interviews. Students learn how to ask open-ended questions and how concepts, categories, and themes are developed using grounded theory. They learn how to analyze qualitative data. By the end of the course, students are able to conduct qualitative interviews using a script and are able to use open coding to identify concepts, categories, and themes.

## **Fall Courses**

### **Advanced Seminar in Health Services Research**

The objective of this weekly course is to take students through each step of formulating and designing their own research projects. The students discuss each others' ideas, progress, and proposed research designs to gain a better understanding of the process, and use this structured opportunity to discuss their work. At each of these meetings, two of the students report on the status of their projects. The primary and secondary mentors for the students presenting at the session also participate in the discussion.

### **Biostatistical Data Analysis I**

The course emphasizes the use of multiple regression analysis, analysis of variance, and related techniques to analyze data in a variety of situations. Topics include least squares estimation, multiple regression, model selection techniques, detection of influential points,

and goodness-of-fit criteria. Practical applications are implemented using a modern, widely available statistical package (JMP). Students gain an understanding of statistical concepts and models.

### **Community-Based Participatory Research**

This objective of this new course is to introduce students to the principles of community-based participatory research as a methodology. It teaches students the key principles, the processes used in such studies, and how they can be used to address health disparities. At the end of the course, students will know how to determine the key community partners, build community buy-in, establish a coalition of community partners, prioritize concerns, develop research initiatives, and disseminate key findings.

### **Health Care in the U.S: Policy and Politics**

This course focuses on policy issues that affect all health care practitioners. How is the health care system organized? Who pays the health care bill? Why have efforts to enact national health insurance failed? What role does government now play in the U.S. health care system and how do the different levels of government share these tasks? How can government encourage good quality care? By the end of the course, students have an understanding of how the current health care system has evolved, and major forces in its evolution.

### **Improving Quality and Safety**

The objective of this new course is to focus on the special methodological challenges in quality and effectiveness research. Systems approaches will be emphasized. Students will learn about developing quality metrics, collaborative improvement strategies, and major new innovations in the field. Special strategies for the collection and ongoing tracking of data relevant to safety and quality will be reviewed. Students will be introduced to approaches to reduce medical errors. By the end of the course, students will be able to add value to the New York Presbyterian Hospital quality improvement teams.

### **Information Skills**

This course provides techniques for finding relevant information from a variety of online resources through group activities and customized tutorials. It is taught in two sessions in the summer and eight sessions in the fall. By the end of the class, students can find and track health-related information from the Internet, know how to broaden or narrow searches, how to critically evaluate and quality filter the results, and manage their references.

### **Public Datasets for Health Services Research**

This course focuses on conveying information on micro-level data sets useful for research in health related fields—including Medical Expenditure Panel Survey, National Health Interview Survey, Health and Retirement Survey, and National Ambulatory Medical Care Survey. After an introduction to the different data sets, students learn to select one data set for hands-on analysis using the actual database. By the end of the class, students are able to select specific data sets to address specific questions. With the expansion of the course, students will be able to begin analyzing the data.

### **Research Ethics**

The purpose of this seminar is to review and critically evaluate the philosophical underpinnings of current guidelines and regulations for the responsible conduct of research. It considers different aspects of doing research where moral decision-making is necessary. Investigators' responsibilities as members of the scientific community and gatekeepers of public trust in science are discussed. Topics include ethical questions related to the research process, professional integrity, authorship, and respect for human subjects. Case studies

are used. By the end of the course, students should be able to rigorously follow principles of responsible conduct of research.

### **Responsible Conduct of Research**

The objectives of this course are to heighten students' awareness of ethical considerations relevant to the conduct of research; inform students of federal, state, and institutional policies, regulations, and procedures; and provide students with critical analysis and problem solving skills for ethical decision-making.

### **Thesis Preparation**

The objective of this one-day course is to describe the elements and process of organizing, writing and presenting a graduate thesis.

## **Spring Courses**

### **Advanced Health Survey Design**

This course reviews survey research methods for collecting, analyzing, and evaluating health survey data. Topics include sampling theory, questionnaire design, interviewing, and methods of survey administration. At the end of the course, students are able to design a survey, administer, and analyze it.

### **Biostatistical Data Analysis II**

This objective of this course is to convey basic concepts underlying multivariate analysis, with an emphasis on the handling of dimensional data. Considerations in dealing with survival analysis, odds ratios, and risk ratios are also covered in the course. At the end students are able to evaluate data using appropriate regression techniques, and interpret the computer program output correctly.

### **Changing Health Policy**

This course examines the process of changing health policy. It builds on students' existing knowledge of the health care system and policy issues. The course focuses on how public policy is developed and shaped and how policy changes are initiated and implemented through interest groups, advocacy groups, and the political environment and how they shape the actions of policy makers and policy-making bodies. By the end of the course, students are able to distinguish different sources of health policy, explain the roles of interest groups in shaping policy change, and analyze current examples.

### **Cluster Randomized Trials**

This course deals with the methodological and ethical issues in the conduct of cluster randomized control trials. Several examples are used to illustrate the key issues of multilevel measurement and analysis in community based prevention trials. By the end of the course, students are able to begin to plan a cluster randomized trial, and understand key biases to be avoided.

### **Economic Evaluation in Health Care**

This advanced course provides an in-depth exposure to techniques used by health economists and other health services researchers in evaluating the economic attributes of a program or intervention. Students learn how to critique cost identification, cost of illness and cost benefit, and cost-effectiveness studies and use these techniques in their own research projects. By the end of the course, students are able to structure an economic evaluation for their project.

### **Grant Writing**

This course is designed to introduce students to grant writing and peer review. In the first two weeks, sessions cover study design, writing abstracts, specific aims, background, preliminary studies, and methods. Other sessions include budget and justification development, how to select funding agencies and types of applications. Students write an R01 grant application and then serve as "study section" to provide primary and secondary reviews for each proposal. By the end of the course, students can write a grant.

### **Introduction to Hierarchical Models**

This course describes the use of hierarchical models as a means to handle correlated data, and discusses the building of hierarchical models. Specific topics include linear mixed models, generalized linear models, generalized estimating equations, and the incorporation of nested structure and/or repeated measures. By the end of the course, the students are able to make use of these models to handle correlated and repeated measures of data of continuous, count or binary data types.

### **Multicultural Approaches to Community Health and Disease Prevention**

This course provides an overview of cultural diversity and its impact on the development and implementation of health promotion policies, programs, and health services research. Students learn how to recognize human differences, identify their own biases, and foster the development of awareness, sensitivity, knowledge, and skills required to implement effective health promotion and disease prevention care for culturally diverse populations. By the end of the course, students are able to understand how cultural differences may impact on their research.

### **Structural Equation Modeling**

This course is an introduction and overview of structural equation modeling, including such diverse techniques as path analysis, confirmatory factor analysis, cause modeling with latent variables and analysis of variance and multiple linear regression. In particular, the course will examine the five steps that characterize most applications: specification, identification, estimates, assessment of fit, and respecification. By the end of the course, students are able to fit structural equation models.

### **Teaching How to Teach**

This course is based on the curriculum designed by Dr. Kelly Skeff at Stanford University and is designed to impart practical skills useful to teachers. At the end of the course, students learn effective communication skills that can be employed in teaching as well as patient care.

### **Multidisciplinary Conferences and Colloquia**

#### **Center for Complementary and Integrative Medicine Conference**

Center faculty, collaborating investigators, and outside visiting scientists present various research projects or reviews of the literature relevant to complementary and integrative medicine. This conference provides students with the opportunity to hear about diverse research areas in the field. The group meets on a bi-weekly basis. This conference has been approved for Continuing Medical Education accreditation.

#### **David Rogers Health Policy Colloquium**

The objective of this seminar is to provide broad exposure to the cultural, social, political, and economic issues shaping health policy. Weekly sessions with ample time for discussion are held with speakers from local, state, and national government; private industry and foundation executives; health policy think-tank analysts; academics; and consumer and community interest groups.

**Health Disparities: Challenges and Opportunities**

This conference, organized by Dr. Boutin-Foster and Dr. Carlyle Miller, the Associate Dean for Student Affairs and Equal Opportunity Programs, will draw a distinguished group of visiting professors to share their research and policy initiatives.

**Health Services Research Journal Club**

This weekly journal club focuses on improving quality of care, improving safety and reducing medical errors, and is led by students. Each week the students lead a discussion on recent literature on methods to improve safety and quality, including approaches to patient centered care. The sessions will provide the chance to review and debate results in the recent literature.

**Research Methodology Conference**

The objective of this conference is to focus on challenges in research methodology and to address issues that have arisen in the design and conduct of studies. The conference operates as a "think tank" on issues, and includes a full meeting of an interdisciplinary group consisting of clinical epidemiologists, biostatisticians, behavioral scientists, health services researchers, medical informatics experts, and cooperating investigators. The group meets on a bi-weekly basis. This conference has been approved for Continuing Medical Education accreditation.

**Weill Cornell Ethics Course**

This course is required for all M.S. students at Weill Cornell, and is Internet based. The objective of this course is to convey the critical issues in the ethical conduct of research. It focuses on informed consent, preserving confidentiality, data management, misconduct, human subjects, and animal subjects. Students are introduced to basic issues in credit and responsibility in science including criteria for authorship, conflict of interest, accountability of authors and reviewers, and data integrity.